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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,632	11/05/2002	Chao-Fu Weng	8012-US-PA	4229

31561 7590 10/14/2003

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER

HA, NATHAN W

ART UNIT PAPER NUMBER

2814

DATE MAILED: 10/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/065,632

Applicant(s)

WENG, CHAO-FU

Examiner

Nathan W. Ha

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group II in Paper No. 4 is acknowledged.

The cancellation of claims 1-14 is also acknowledged.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwon et al. (US 2002/0017711, hereinafter Kwon, previously cited) in view of Akram et al. (US 2003/0067073, hereinafter Akram, hereinafter Akram.)

In regard to claim 15, in figs. 6-7, Kwon discloses a process for fabricating a bump comprising:

performing an activation step by opening the passivation layer 106 to expose the chip pad 104. The pad 104 is coated by a medium layer, Zinc; see sections [0022] and [0023]; and

forming body 110 on the medium layer on the medium layer; see section [0023].

Kwon, however, does not expressly disclose the bump formed by electroless plating. It should be noted that the method of electroless plating is widely used in the art

of making semiconductor device since it is a conventional process. Kwon actually teaches this method to make the body of the UBM, 108. Therefore, using this method to make the solder bump is recognizable to one of ordinary skill in the art. It provides a convenience and cost effective. For instance, Akram, in figs 2-3, discloses and analogous UBM device and further teaches a method of electroless plating to form the solder bump 80; see [0030].

Therefore, it would have been obvious to one of ordinary skill in the art at the time for the invention was made to adapt the method as taught by Akram in Kwon in order to obtain the advantage mentioned above.

In regard to claim 16, Kwon further discloses that the bump is made of Nickel; see section [0023].

In regard to claim 17, see the above discussions regarding to claim 15.

3. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwon and Akram as applied to claims 15-17 above, and further in view of Hwan et al. (US 2002/0180064, herein after Hwan.)

In regard to claim 18, Kwon and Akram's combination discloses all of the claimed limitations as mentioned above except a step of forming a photo resist layer on the chip, wherein the photo resist has at least an opening that exposes the bonding pad and the step of removing the photo resist.

Hwan, in fig. 1C, discloses an analogous device including bon pad and further discloses a step of forming a photo resist layer 34 on the chip 12, wherein the photo resist has at least an opening that exposes the bonding pad 26 and the step of

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removing the photo resist in order to form a column bump pad that has mushroom structure; see section [0007]. It is also a well-known method to make UBM bump.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the photo resist as taught by Hwan in Kwon and Akram in order to obtain the advantage mentioned above.

In regard to claims 19-20, Hwan further discloses a bump body passivation 208 that made of Gold, in fig. 2D, in order to protect the metal layer below from oxidation, metal 207; see section [0029].

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the photo resist as taught by Hwan in Kwon and Akram's in order to obtain the advantage mentioned above.

Response to Arguments

54. Applicant's arguments with respect to claims 15-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

5. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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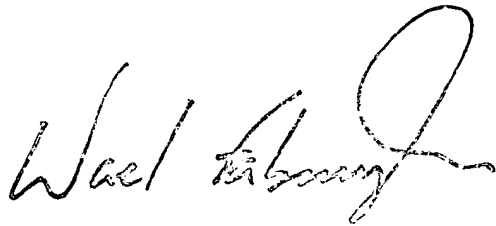
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan W. Ha whose telephone number is (703) 305-3507. The examiner can normally be reached on M-TH 8:00-7:00(EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and 308-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Nathan Ha
September 29, 2003


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